UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Advanced Foundations of Physics for AI

2425-1-F9102Q003

Aims

Acquire the fundamentals in classical electromagnetism, quantum mechanics, nuclear and particle physics needed to approach the signal production and detection, with the ability to place each process in the proper physics context and to exploit the scientific literature for an effective understanding of specific problems in the context of data analysis of scientific and environmental measurements.

Contents

The course will cover an overview of classical electromagnetism and electrodynamics, wave mechanics, quantum mechanics principles, particle physics and radioactivity, radiation-matter interactions, particle and radiation sensing principles and main technologies.

Detailed program

- Classical Electromagnetism and Electrodynamics
- Wave Mechanics
- Quantum Mechanics foundations
- Nuclear Physics, Particle Physics Foudations and Radioactivity
- Radiation - Matter interaction, Detection Principles

Prerequisites

Calculus foundations, classical mechanics and its fundamental laws as studied in any scientific bachelor course will be the starting point for the teaching.

Teaching form

Frontal lessons will alternate with seminars held by students, prepared in groups with the help of university tutors. All the lessons will be held in presence, unless further COVID-19 related restrictions are imposed, and the attendance is highly recommended.
Lectures will be live-streamed and the link will be published on the e-learning webpage of the course, where also recordings of each lesson will be published.

Textbook and teaching resource

- Lecture slides and recordings regularly published in the site page
- Bibliographic references documented for each lesson, from resources available on-line or in the Milano - Bicocca library

Semester

First

Assessment method

The course assessment will be based on a final test followed by an oral exam, and on an evaluation of the student seminars.

Office hours

by email appointment with teachers

Sustainable Development Goals

QUALITY EDUCATION | DECENT WORK AND ECONOMIC GROWTH | INDUSTRY, INNOVATION AND INFRASTRUCTURE | SUSTAINABLE CITIES AND COMMUNITIES | CLIMATE ACTION